

WHAT IS CLAIMED IS:

1. A companion cartridge comprising at least one system chosen from reagent storage system, a calibration fluid system, an assay element preparation system, a carrier fluid system, and a waste retrieval system, said system connected to a sensing cartridge to conduct chemical analysis of at least one assay element.
2. A companion cartridge according to claim 1, wherein:

said companion cartridge is adapted to at least one interface with said sensing cartridge chosen from fluid, mechanical, and electrical.
3. A companion cartridge according to claim 1, wherein:

said calibration fluid system connects to said waste retrieval system.
4. A companion cartridge according to claim 1, wherein:

said assay element preparation system comprises at least one process chosen from blood chemistry, hematology, immuno-diagnostics, and DNA testing.
5. A companion cartridge according to claim 1, wherein:

said assay element preparation system comprises at least one operation chosen from thermo cycling, incubation, and isolation.
6. A companion cartridge according to claim 1, wherein:

said carrier fluid system adapted to increase at least a portion of the volume of at least one assay element.
7. A companion cartridge according to claim 6, wherein:

said carrier fluid system connects to said waste retrieval system.
8. A companion cartridge according to claim 6, wherein:

said carrier fluid remains essentially unmixed with said assay element.
9. A method of miniature chemical analysis comprising:

at least one unit operation chosen from:

storing at least one reagent on a companion cartridge;

calibrating at least one sensor on a sensing cartridge with calibration fluid stored on said companion cartridge;

preparing said at least one assay element for said assay;

transporting said at least one of said assay elements with a carrier fluid; and

retrieving waste from said assay

wherein said sensing cartridge is in fluid contact with said companion cartridge.

10. A method of miniature chemical analysis according to claim 9, wherein:

said preparing comprises at least one process chosen from blood chemistry, hematology, immuno-diagnostics, and DNA testing.

11. A method of miniature chemical analysis according to claim 10, wherein:

said process comprises lysis of said assay element.

12. A method of miniature chemical analysis according to claim 10, wherein:

said process comprises isolating DNA from said assay element.

13. A method of miniature chemical analysis according to claim 10, wherein:

said process comprises amplifying said assay element with PCR.

14. An analytical instrument comprising:

a companion cartridge comprising at least one unit operation chosen from a reagent storage system, a calibration fluid system, an assay element preparation system, a carrier fluid system, and a waste retrieval system; and

a sensor cartridge, said sensor cartridge in fluid contact with said companion cartridge, wherein said sensor cartridge provides chemical analysis of at least one assay element.

15. An analytical instrument according to claim 14, wherein:

said chemical analysis comprises at least one clinical process chosen from blood chemistry, hematology, immuno-diagnostics, and DNA testing.

16. An analytical instrument according to claim 14, wherein:

said chemical analysis comprises lysis of at least one assay element.

17. An analytical instrument according to claim 14, wherein:

said chemical analysis comprises isolating DNA from at least one assay element.

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18. An analytical instrument according to claim 14, wherein:

said chemical analysis comprises amplifying at least one assay element with PCR.

19. A miniature analytical instrument comprising:

a sensor cartridge for chemical analysis of at least one assay element adapted to fluid contact with a removable companion cartridge.

20. A miniature analytical instrument according to claim 19, further comprising:

said companion cartridge in fluid contact with said sensor cartridge, said companion cartridge comprising at least one system chosen from reagent storage system, a calibration fluid system, an assay element preparation system, a carrier fluid system, and a waste retrieval system.